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# The length of historical path and the digitalization speed of record labels: A path dependence perspective

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## ABSTRACT

Drawing on the theory of organizational path dependence, we investigate how the length of historical paths affects the digitalization of record labels—music organizations that release sound recordings and music videos. We propose a negative relationship between the length of a label's historical path and the speed of its first digital recordings, arguing that this relationship is intensified by the diversification of international markets and music formats, as well as the degree of digitalization of the label type and the home market. While diversification promotes path learning by accumulating knowledge and experience from historically established practices, the degree of digitalization shapes path synergy by determining the extent to which a record label can match its resources with its digital operating environment. Our arguments gain empirical support from analyses of 5,129 record labels in 68 countries between 2000 and 2018.

## 1. Introduction

The concept of an organization's historical path is fundamental to the organizational path dependence perspective (David, 1985; Gruber, 2010; Sydow et al., 2009). Yet, despite the inherent temporal nature of organizational path dependence, prior research has considered the temporality of organizational path dependence to be an implicit assumption rather than an explicit focus. Scholars have conceptualized the organizational path either as a historically determined process with a time horizon (David, 1985; Sydow et al., 2009) or as a process influenced by actors' experience and knowledge (Gruber, 2010). These temporal implications have been central to understanding the impacts of path dependence on technologies (Arthur, 1989; David, 2001), organizational strategies (Koch, 2008, 2011), export behavior (Casillas et al., 2012), financial structures (Samuelsson et al., 2020), and corporate governance (Manning et al., 2018). However, prior research has focused mainly on how past events in an organization's historical path influence present actions (Sydow et al., 2009) and examined "the inability of organizations to change" the patterns of these historical events (Arthur, 1989; Sydow et al., 2020, p. 717). Without conceptually identifying and empirically validating the theoretical mechanisms and boundaries of the temporal dimension of organizational path dependence, theoretical advancement in this field will be constrained.

We shed light on this research gap by analyzing how the length of an organization's historical path influences the speed at which it adopts digital technologies within the music industry. Although many cultural and creative organizations have started transitioning their products to online platforms (Coelho & Mendes, 2019), some record labels—music organizations that release sound recordings and music videos—remain hesitant to adopt digitalization. In comparison with traditional formats of music media such as vinyl, cassette, and compact disc (CD), digitalization requires that music organizations replace the skills and knowledge accumulated throughout their historical paths with new capabilities suited for the digital environment (Sousa & Rocha, 2019). Thus, these record labels are likely to persist with historical paths that have been proven with positive feedback loops (Bohnsack et al., 2021; Marquis & Qiao, 2024; Sydow et al., 2009, 2020). Due to the historical imprinting (Beckman & Burton, 2008) and organizational inertia (Gruber, 2010) formed and strengthened in historical practices, record labels with a long historical path are likely to delay the adoption of digitalization in comparison with those with a short historical path because of the path-learning and path-synergy mechanisms underlying the path dependence impacts (Audia & Goncalo, 2007; Sydow et al., 2009, 2020; Tang et al., 2012).

Furthermore, the length of an organization's historical path does not affect all organizations in an identical way. Prior strategic management

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research has shown that organizations that diversify their markets can recursively exploit the existing resources and knowledge in their historical path (Andreou et al., 2016; Mayer et al., 2015). As organizations diversify their market differently, their resources and knowledge are accumulated differently, which results in different effects of path dependence. Likewise, past studies have shown that matching an organization's characteristics to the operational environment facilitates technological adoption, but a mismatch impedes it (Depietro et al., 1990). Given the significant commitment required to implement breakthrough technologies like digitalization, a technological environment that matches an organization's existing resources can help organizations leverage those resources to break away from established paths and adopt the new technology (Chesbrough, 2010; Sosna et al., 2010); otherwise, it cannot help. An organization's peers shape the environment in which the organization operates, and the degree of peers' adoption of breakthrough technology influences how the technological environment matches the organization's resources. Yet, despite theoretical evidence for the variation in path dependence effects, the extant literature lacks theoretical insights into the conditions under which these effects are amplified or mitigated. Thus, our study not only answers *how the length of an organization's historical path delays its adoption of new technologies* but also investigates *how this path dependence effect is intensified by the extent of the organization's market diversification and the degree of digitalization of its peers*.

We sought to answer these questions by analyzing the first digital music releases of 5,129 record labels in 68 countries between 2000 and 2018. The music industry<sup>1</sup> provides a distinctive research context for testing our theoretical arguments in that the advent of digital technologies has provided new opportunities for value creation and value capture through the digitalization of traditional products (Bohnsack et al., 2021). Digitalization is the most prominent feature in the culture industry (Mangematin et al., 2014), particularly in the music sector (Bello & Garcia, 2021; Bourreau et al., 2013; Brewster, 2021). Our empirical analyses show that the length of a record label's historical path has a negative impact on the record label's first digital release online (i.e., decelerating the digitalization speed). This negative impact is more pronounced for record labels with high levels of geographic and product diversification and for those surrounded by peer labels with higher degrees of digitalization in the same music subsector (i.e., a label type) and the same home market.

Our study, therefore, contributes to the strategic management literature with novel evidence on the impact of organizational path dependence on the adoption of new technologies. Specifically, our focus on the length of a music label's historical path departs from the conventional wisdom that has demonstrated the importance of historical events for organizations' delayed path-breaking efforts (Sydow et al., 2009, 2020). We argue that organizations rely on their historical paths due to historical imprinting and organizational inertia (Beckman & Burton, 2008; Gruber, 2010). This perspective advances the understanding of organizational path dependence by highlighting that an organization's previous activities, such as a record label's adoption of vinyl and CD technology, do not necessarily impede or help its adoption of a breakthrough technology such as digitalization. However, a prolonged reliance on traditional technologies is more likely to delay the adoption of new technologies than a shorter history of the tradition. This impact is underpinned by path-learning and path-synergy mechanisms. Path learning indicates that organizations accumulate experience and knowledge via positive feedback over time (BarNir et al., 2003), which reinforces organizational dependence on the established paths. Path synergy, on the other hand, suggests that organizations synergize complementary skills and capabilities developed in their historical path, further enhancing their reliance on established practices. These

mechanisms are particularly relevant in the music industry, where digital releases dominate the market but have yet to replace traditional formats fully (IFPI, 2022). Our study, therefore, responds to recent calls for research on the timespan of an organization, in which the organization's existing structures, routines, and cultures reinforce historical influences on its current actions (Marquis & Qiao, 2024).

In addition, our findings on the two categories of moderating effects provide theoretical nuance to organizational path dependence theory by identifying and distinguishing its underlying mechanisms. The diversification of geographic and product markets (i.e., international diversification and music format diversification) strengthens the relationship between the length of a record label's historical path and the speed of its first digital release through the path-learning mechanism, whereas the degree of digitalization of peers in the same sector and the same home market does so via the path-synergy mechanism. This distinction arises because diversified markets facilitate the exploitation of established approaches, thereby strengthening the learning effect in the traditional path (Andreou et al., 2016; Mayer et al., 2015). In contrast, a higher degree of digitalization of peers results in a mismatch between the existing resources accumulated in the historical path and the digitalization-specific resources in the external environment, thereby intensifying the challenges of synergizing traditional and new technologies (Schreyögg & Sydow, 2011; Sydow et al., 2009). Recent research has highlighted the relevance and importance of incorporating market diversification and degree of digitalization into path-dependence research (Forliano et al., 2023; Schwarz et al., 2020; Wang et al., 2020). This theoretical nuance is vital because organizational path dependence does not affect organizations in one way but in various ways (Sydow et al., 2020). The empirical contribution of our paper is a quantitative analysis of the effect of path dependence on music labels' digitalization, thereby contributing to the path dependence literature in cultural industries, which has primarily relied on qualitative case studies focusing on sectors such as books and newspapers. The novelty of our empirical approach responds to a recent call for studies on digitalization in the music industry, not only through qualitative case studies but also large sample quantitative analyses (Wang et al., 2020). In this sense, our study on the digitalization of music record labels offers both new insights into the theory of organizational path dependence and new findings in a distinctive research context.

## 2. Theory and Hypothesis development

### 2.1. The historical path of organizations

The significance of historical paths has been emphasized in three streams of path-dependence literature. The first of these is the classic path dependence literature, which explains how historical choices of technology (e.g., the QWERTY keyboard layout) become dominant over time, despite potentially more efficient technological alternatives (Arthur, 1989; Arthur, 1994; David, 1985, 2001). In the technology-specific path dependence literature, technological path development is primarily considered a historically determined process. It defers from the economic logic of equilibrium and efficiency in that the historical process goes beyond the reach and consciousness of influential and knowledgeable actors (e.g., technicians) and renders them "unable to shake free of their history" (David, 2001, p. 19). The dominance of a technological path is driven by self-reinforcing processes such as network externalities and increasing returns, which often lead to a difficult-to-escape "lock-in" to a particular technology path unless it is destabilized by external shocks and crises (Arthur, 1989; Arthur, 1994; Pierson, 2000).

The second stream of path dependence research emphasizes the role of mindful actors and their agency in strategically and deliberately shaping the development of paths (Garud & Karnoe, 2001; Gruber, 2010; Kalasin et al., 2014; Su et al., 2023). Within this literature, some studies contend that history and human agency are intertwined in

<sup>1</sup> Appendix A provides background information on the evolution of music distribution and its digitalization.

shaping and developing organizational paths (de Groote & Kammerlander, 2023; Singh et al., 2015; Stache & Sydow, 2023; Sydow et al., 2012). While focusing on the deliberate planning and mindful action of powerful collective actors in path formation, this research stream aligns with the classic conceptualization of technology path dependence and argues that the established path will stabilize in subsequent phases of path development regardless of whether the path has been generated through planned or unplanned processes (Meyer & Schubert, 2007; Singh et al., 2015; Stache & Sydow, 2023). The paths initially created by the deliberate planning and mindful action of actors become stabilized over time, either through positive feedback loops without the consciousness of actors or with sustained support from relevant and powerful actors (de Groote & Kammerlander, 2023; Su et al., 2023). Moreover, prior studies have pointed out that mindful actors are pivotal sources of path dependence because these actors are influenced by their history and important institutions (Staber, 2005). For example, de Groote and Kammerlander (2023) demonstrated that family businesses exhibited stronger path dependence due to historical characteristics such as power hierarchy, stakeholder network embeddedness, and obligation to tradition.

Integrating the technology-specific view and the human-agency perspective, Sydow and colleagues developed the concept of path dependence in organizational research, which accounts for an organization's inability to adapt to environmental changes (Schreyögg & Sydow, 2011; Sydow et al., 2009, 2020). Sydow et al. conceptualized an organizational path as a rigidified, potentially inefficient action pattern that is influenced by previous actions and self-reinforcing mechanisms (Sydow et al., 2009, 2020). Among its multiple dimensions, the temporal dimension of path dependence is represented by the length of the historical path (Argyres et al., 2020) and is inherent in the conceptualization of organizational path dependence, which explains current organizational actions, behavior, and decisions according to past organizational events and developments (Kipping & Üsdiken, 2014). The temporal dimension is significant for the conceptualization of organizational path dependence because path dependence processes "do not refer to a certain point in time; instead, a longer time horizon is covered" (Sydow et al., 2009, p. 695) and "may exist for quite some time" (p. 701).

The organizational path dependence perspective conceptualizes a historical path as the preceding sequence of events and the cyclical, self-reinforcing relation of events that shape an organization's pattern of behavior (Sydow et al., 2020). In other words, an organization's current actions follow previous actions and influence subsequent actions in its history (Ormiston, 2023; Tang & Ho, 2019). This self-reinforcing loop stabilizes a particular organizational path of strategic behavior over time (Koch, 2008, 2011), implying that the number of historical paths within an organization gradually decreases because historical actions foster the repetition of similar actions in the future (Bohnsack et al., 2021; Vergne & Durand, 2010). Compared to technology solutions (e.g., the QWERTY keyboard layout), path dependence in an organizational process is not likely to reach a state of full restriction and determinacy that excludes all alternatives due to the social characteristics of organizations. In this sense, organizational path dependence suggests a restricting corridor of the scope for action throughout an organization's history, in which knowledgeable and powerful actors often have the scope to interpret the underlying organizational paths differently, thereby bringing about some variation in their replicative practices (Sydow et al., 2009). Although organizations may have deliberately explored new products, services, or business models (Koch, 2008; Wenzel, 2015; Wenzel et al., 2017), they may remain path-dependent because the new alternatives (e.g., a new business model) and their consequences (e.g., the revenue decrease due to the new business model) may strengthen previous strategic actions (Rothmann & Koch, 2014), rather than encouraging the adoption of new alternatives. The conceptualization of the historical path in the organizational path dependence perspective underscores the vital roles of social self-

reinforcing mechanisms in driving the development of organizational paths or behavioral patterns (Brekke et al., 2024; Dobusch & Schüßler, 2013; Wenzel et al., 2017). Table 1 summarizes key conceptual studies on path dependence.

## 2.2. The length of an organization's historical path and its path dependence

As a crucial element of the organizational path dependence perspective (Sydow et al., 2020), the length of an organization's historical path is underpinned by two mechanisms: imprinting (Beckman & Burton, 2008) and organizational inertia (Gruber, 2010), both of which enforce the path dependence of organizations. Prior studies have argued that imprinting is a specific root of path dependence (Beckman & Burton, 2008), and organizational inertia influences organizational path dependence (Gruber, 2010; Omidvar et al., 2023). As per the imprinting logic, path dependence suggests that an organization's founding characteristics, which reflect idiosyncrasies of the external environment at the time of incorporation, imprint its organizational decision processes at later stages, despite significant environmental disruptions in the subsequent periods (Marquis & Tilcsik, 2013). In this sense, the gap between an organization's present operational environment and its founding conditions increases with the length of its historical path, and the organization may consequently face increased difficulties in adopting new technologies that are likely to disrupt historically established organizational paths. Therefore, the organization becomes more path dependent (Soto-Simeone et al., 2020), and its actions are funneled (Sydow et al., 2020), indicating that some actions are more likely to be taken than others due to historical imprints.

According to the organizational inertia logic, path dependence suggests that the length of an organization's historical path is associated with organizational stability and resistance to environmental changes (Hannan & Freeman, 1984). Thus, organizational inertia is more substantial in organizations with lengthy historical paths (Carroll & Hannan, 1989; Singh & Lumsden, 1990). This argument is grounded in observations of organizational life cycles, in which organizations experience several predefined sequential stages from birth and growth to maturity and declination (Carroll & Hannan, 1989; Singh & Lumsden, 1990). As each subsequent organizational stage is associated with a significant increase in structural complexity and formalization, organizational inertia grows monotonically in an organization's historical path. Due to increasing inertia pressures, organizations with a lengthy historical path cannot adapt well to disruptive environmental changes caused by breakthrough technologies such as digitalization (Haskamp et al., 2021; Le Mens et al., 2015). As such, organizations with lengthy historical paths are more path dependent than those with short historical paths.

## 2.3. The impact of path dependence on organizations in the era of digitalization

Digitalization refers to the use of Information and Communication Technologies (ICTs), the Internet, and mobile phones to facilitate information and data gathering, storing, processing, analyzing, and sharing (Romero-Martínez & García-Muiña, 2021; Sanchez-Riofrio et al., 2021). Previous studies have examined digitalization orientation (Saesen et al., 2024; Xie & Wu, 2024), digital adoption and transformation (Adomako et al., 2021; AlNuaimi et al., 2022; Chen et al., 2024; Ferreira et al., 2019; Kumar et al., 2021; Malodia et al., 2023), digital capability (Eller et al., 2020), digital product innovativeness (Miric & Jeppesen, 2020; Tortora et al., 2021), the scope of digital innovation (Avelar et al., 2024; Xie & Wu, 2024), and digitalization performance (Cohen & Tripsas, 2018; Endres et al., 2022; Pesch et al., 2021). Moreover, existing research has synthesized prior literature on digitalization impacts on organizational change (Qiu & Pesch, 2019), with a particular focus on business models (Caputo et al., 2021; Endres

**Table 1**  
Theoretical Perspectives on Path Dependence <sup>a</sup>.

References	Conceptual focus	Conceptualization of path dependence	Self-reinforcement mechanisms	Path dependence effects	Path dependence outcomes
Arthur (1989); Arthur (1994)	Path dependence of technologies	A nonergodic and historically determined process.	Increasing returns; positive externalities; non-predictability; non-ergodicity; inflexibility, and inefficiency	Learning and construction experience	Hard-to-escape lock-in
David (1985, 2001)	Path dependence of technologies	A dynamic property of allocative processes.	Self-reinforcing Increasing returns (e.g., to scale, to scope, and to learning); positive network externalities	Historical learning	Hard-to-escape lock-in
Koch (2008, 2011)	Strategic path dependence	A specific strategic pattern developed over time, constituted, and maintained by positive feedback loops, originally triggered by historical events and decisions, leading to the lack of choices.	Economies of scale and scope, direct and indirect network externalities, learning effects, adaptive expectations, coordination effects, and complementarity effects	Synergy of strategic components	Lock-in in strategic premises
Page (2006)	The forms of history dependence	Current and future states, actions, and decisions depend on previous states, actions, and decisions.	Negative externalities in addition to positive feedback	Learning from historical outcomes	Hard-to-escape lock-in
Schreyögg and Sydow (2011); Sydow et al. (2009)	Path dependence of organizations	A rigidified, potentially inefficient action pattern built up by the unintended consequences of former decisions and positive feedback processes.	Adaptive, coordination, learning, and complementary effects	Organizational learning and synergy of resources, rules, and practices	Lock-in but without excluding all alternatives
Vergne and Durand (2010)	Path dependence of organizations	A mechanism that connects the past and the future in an abstract way.	Negative externalities, and contingencies	Learning specialization and experience	Lock-in but without excluding all alternatives

<sup>a</sup> We conducted a systematic literature search using the Web of Science Core Collection (WOS) as the primary search system, focusing on articles that have keywords related to path dependence and digitalization. We searched top-tier journals and identified (1) conceptual articles of the organizational path dependence theory, as included in Table 1, (2) empirical studies using digitalization as a dependent variable, listed in Table 2, and (3) empirical studies based on the organizational path dependence theory, presented in Table 3. As our study is not aiming at a literature review, the literature review methodology is not detailed here but is available upon request.

et al., 2024; Mostaghel et al., 2022) and internationalization patterns (Bergamaschi et al., 2021). Table 2 summarizes empirical studies on digitalization, showing that, despite the recognized importance of digitalization speed (Farzin et al., 1998), the extant literature provides limited insights into this concept.

Furthermore, past studies have investigated various effects of path dependence and the conditions under which they occur. However, it remains unclear whether such effects apply to the digital world and, if they do, how these effects are strengthened or weakened. Table 3 lists empirical studies on the impact of path dependence on different organizational strategies. As a breakthrough technology, digitalization disrupts the business operating environment (Parviainen et al., 2017) and disturbs firms' previous track and current path. For example, Moreau (2013) argued that while former technological innovations such as vinyl records, audio cassettes, and CDs did not significantly impact music distribution, disruptive innovations through the ICTs, Internet, and mobile phones have profoundly affected the music distribution sector. The turbulent and ever-changing digital business environment pushes organizations to develop and implement digital strategies and business models more quickly than they were previously required to do in the analog era (Bohnsack et al., 2021; Nadkarni & Prügl, 2021). Previous research has found that the growing integration of digital technologies into existing business models can potentially break path dependence and escape from lock-in situations (Bohnsack et al., 2021; Bohnsack et al., 2014).

Nevertheless, organizations with a long historical path often find it challenging to integrate disruptive digital technologies. In the cultural and creative industries, music organizations and book and newspaper publishers took longer to adopt digital technologies than organizations in other industries (Moreau, 2013; Schreyögg & Sydow, 2011). For instance, Bourreau et al. (2013) noted that despite declining music sales in France during 2002 and 2003, half of the French record labels had still not adopted digitalization by 2006. Rothmann and Koch (2014) discovered that premium German newspaper publishers struggled with technological change and the advent of the Internet. As such, digital attempts of premium German newspapers did not lead to fundamental strategic changes but were used to restore the efficiency of previously

successful strategies (i.e., subsidizing journalistic products through advertising revenue). Likewise, Koch (2008, 2011) found that previously developed strategic paths generally restricted the strategic scope of actions of high-quality German newspaper publishing organizations. Similarly, Schreyögg et al. (2011) found that a German book club developed an internet-based bookstore to improve declining revenue, but it was unsuccessful.

The difficulty these organizations faced in adopting digitalization is rooted in their historical paths, in which organizations reinforced their previous strategic actions via path learning and path synergy. Sydow et al. (2009) suggested that the persistence of and lock-in to existing organizational resources, routines, and practices are driven by two self-reinforcing mechanisms: path learning and path synergy. The reason for such persistence and lock-in is that path learning and path synergy increase the attractiveness of existing organizational actions while diminishing the attractiveness of alternative organizational actions (Dobusch & Schüßler, 2013; Petermann et al., 2019). Specifically, path learning refers to the accumulation of experience and knowledge, which are specific to a historically established organizational path and cannot be easily transferred to or reused in a new organizational path. Organizations recursively develop skills and routines that are adapted to their current resources and capabilities (Grant, 1991). Moreover, path learning suggests that the more often an organizational operation is performed, the higher the levels of efficiency and quality, and the lower the average costs per output unit (Sydow et al., 2009). The more attractive the historically chosen organizational path is, the less attractive it is for an organization to switch to or create a new one because the accumulated experience and knowledge and decreasing average costs are embedded in the chosen path. Moreover, path synergy occurs when two or more different but interrelated resources, routines, and practices are combined in a way that either increases the attractiveness of historically established organizational actions or makes it challenging to integrate alternative organizational actions that significantly deviate from those that have already been established (Petermann et al., 2019; Pierson, 2000; Sydow et al., 2009). In the following sections, we elaborate on how these two mechanisms shape the impact of path dependence on the speed of digitalization.



**Table 2**  
Prior Studies on Digitalization.

References	Research questions	Industry sectors	Research sample	Study period	Dependent variable	Independent variables	Key findings
Adomako et al. (2021)	How does firm age moderate the correlation between perceived corruption and business process digitalization?	Manufacturing	Survey of 464 firms in Ghana and Nigeria	2019	Business process digitalization	Perceived corruption in home country	Perceived corruption in the home country increases business process digitalization. This effect is stronger among younger firms.
AlNuaimi et al. (2022)	How digital transformational leadership and organizational agility influence digital transformation with digital strategy as a moderator?	Public sector organizations	Survey of 513 employees in UAE	Not reported	Digital transformation	Digital transformation leadership; Organizational agility	Digital transformation leadership and organization agility positively affect digital transformation. Organization agility mediates the relationship between digital transformation leadership and digital transformation.
Avelar et al. (2024)	To explore the importance of the intersection of sustainable entrepreneurship, innovation, and digitalization in SMEs.	Multiple industry sectors	Data from the Flash Eurobarometer 486 gathered through interviews with 16,365 SMEs in the EU27 and 12 non-EU countries	Not reported	Digitalization (i.e., sum of the technology adopted by the firm)	Firm and entrepreneur characteristics	Firm characteristics (such as size, age, turnover international orientation, the number of corporate growth strategy pillars, access to finance) and entrepreneurial characteristics (such as experience in multi business creation) significantly increased digitalization.
Chen et al. (2024)	How worker mobility influences the adoption of a new technology?	Information technology	Aberdeen CI Technology data on over 153,000 establishments from 2010 and 2018	2010–2017	Machine Learning (ML) analytic software adoption	Worker mobility	Changes that facilitate worker movements are associated with a significant decline in the likelihood of ML adoption. This effect is stronger in larger establishments, in large urban areas and in industries that have been lead users of prediction technology.
Cohen and Tripsas (2018)	How using intergenerational bridges influenced inventive performance in the new generation?	Technology and media	84,861 patents held by the focal firms between the years 1974 and 2004	1974–2010	Digital inventive performance (number of citations made to a firm’s digital imaging patent portfolio)	Intergenerational bridges as a type of old and new knowledge recombination at three levels: inventor, technology and hybrid product bridges	Inventor and technology bridges are associated with digital inventive performance.
Eller et al. (2020)	To what degree should firms transform digitally?”	Multiple industry sectors	Survey of 193 Australia and Austrian SMEs	2018	Digitalization capability	IT; Employee skills; Digital Strategy	SME resources such as IT, employee skills, and digital strategy increase SME digitalization capability.
Endres et al. (2022)	Which specific functionality drives the adoption of digital innovation management software (IMS) tools, and which services of IMS providers are valuable in supporting the adoption of IMS by organizations aiming to digitalize their innovation processes?	Manufacturing	199 German firms	Not reported	New digital product development performance (efficiency and effectiveness)	Digital innovation management software (IMS) adoption	Digital IMS adoption has a positive significance influence on NPD efficiency but no significant effect on NPD effectiveness. Idea management functionalities, and updates and upgrades services encourage digital IMS adoption.
References	Research questions	Industry sectors	Research sample	Study period	Dependent variable	Independent variables	Key findings
Endres et al. (2024)	What types of business models are used in practice to successfully unlock the potential of	Not applicable	Content analysis of IIoT projects based on over 2000 articles in industry	Not applicable	Not applicable	Not applicable	The study identified four distinct IIoT business model archetypes: IIoT digital, IIoT service-

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Table 2 (continued)

References	Research questions	Industry sectors	Research sample	Study period	Dependent variable	Independent variables	Key findings
	Industrial Internet of Things (IIoT)		trade magazines and newspapers				centered, IIoT data-driven, and IIoT platform.
Ferreira et al. (2019)	What reasons can lead companies to choose new digital processes?	Manufacturing, agriculture, extractive, construction, etc.	A telephone survey of 938 Portuguese companies	2016	New digital business processes adoption	Maintain market share; Increase market share; Access to new markets; Reduction of costs; Improvement of company image and/or reputation; Flexibility in service provision; Ease in service utilization; Increase in service quality; Increase in range of service provided	Maintain market share, increase market share and increase in service quality significantly increase adoption of digital business processes.
Kumar et al. (2024)	Which country-level factors are driving the two-sided market and how network effects are playing out at the country-level for platform-based mobile payment services?	Retailing	30 countries (17 developed and 13 developing) on the number of Mobile wallets users (in millions)	2009–2013	Digitalization of payment (i.e., mobile payment) adoption by customers and suppliers	Adoption of retailers and customers (network effects); Perceived value; Inertia; Culture	This study confirms the presence of network effects and the differential impact of perceived value, inertia, and culture on the adoption level of innovators and imitators. Moreover, the study found significant level of within- and between-country heterogeneity for mobile payment adoption, which provides further evidence for leapfrogging by emerging countries.
Geng et al. (2024)	Does the digital transformation of focal enterprises generate spillover effects through the supply chain, thus assisting the digital transformation of upstream and downstream enterprises? If so, what is the impact mechanism?	Multiple industry sectors	992 Chinese listed focal enterprise-year-suppliers observations, and 1510 Chinese listed focal enterprise-year-customers observations	2009–2020 for the focal firms and 2010–2021 for suppliers and customers	Digital transformation of suppliers and customers	Focal enterprises' digital transformation	Focal enterprises' digital transformation has a positive effect on digitalization transformation of suppliers and customers.
Malodia et al. (2023)	How do individual differences among entrepreneurs influence the digital transformation journey of SMEs, and does professional leadership impact the digital transformation attempts of SMEs?	7 multiple industry sectors	18 qualitative interviews and collected empirical data from 369 Indian SME entrepreneurs	Not reported	Digital transformation of SMEs (adoption of e-commerce; adoption of digital marketing; use of big data)	Digital self-efficacy of SME entrepreneurs (attitude toward digital transformation; digital literacy); Professional leadership	Digital self-efficacy of SME entrepreneurs and professional leadership positively influence digital transformation of SMEs. Younger entrepreneurs and firms are more inclined to digitalize their firms.
References	Research questions	Industry sectors	Research sample	Study period	Dependent variable	Independent variables	Key findings
Miric and Jeppesen (2020)	Whether piracy affects innovation and whether it leads firms to shift to different types of innovations	Information technology	Digital apps which were sold on the Cydia mobile app marketplace prior to the hacking event but had not been previously pirated	2015 (event of hacking)	Updates in existing digital apps (incremental innovations) vs. investment in new digital apps after the event of hacking	Digital piracy	Piracy leads to a decrease in the release of incremental innovations, such as bug fixes, but does not decrease more substantial revisions.
Pesch et al. (2021)	Does the formalization of digitalization projects facilitate or impede digital product innovation	Manufacturing	Survey of 395 European firms	Not reported	Digital product innovation performance and radicalness	Formalization	Formalization increases digital product innovation performance and radicalness.

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Table 2 (continued)

References	Research questions	Industry sectors	Research sample	Study period	Dependent variable	Independent variables	Key findings
Qiu and Pesch (2019)	To advance the understanding of organizational changes resulted from digitalization, this paper seeks to systematize the findings of the different empirical studies.	Not applicable	Literature review of 92 identified papers derives a framework with six digital technologies and 15 organizational elements	Not applicable	Not applicable	Not applicable	Formalization is more beneficial for digital product innovation in older firms. This study generates a synthesis of organizational impacts pertaining to each digital direction and finds that digitalization brings extensive changes to organizations.
Saesen et al. (2024)	How does CEO overconfidence relate to a firm's digital orientation (DO)? How do market turbulence and technological dynamism moderate the relationship between CEO overconfidence and a firm's DO?	Multiple industry sectors	924 MD&A sections of the U.S. firms listed in the S&P 500	1999–2019 (2008 excluded)	Digital orientation	CEO overconfidence	CEO confidence increases DO. Market turbulence and technological dynamism attenuate this positive effect.
Sousa and Rocha (2019)	What is the level of skills identified by managers to manage the disruptive business that is driven by leading technologies such as IoT, Cloud, Big data, mobile, AI and Robotics?	Multiple industry sectors	Survey of 147 organizations	Not reported	Not applicable	Not applicable	The study identified three types of skills needed for creating and managing digital disruptive business: innovation, leadership and management skills. These skills identified need a moderate/considerable development.
Tortora et al. (2021)	Whether and how different knowledge-based capabilities can support the process of the development of digital innovation?	Mainly manufacturing but also services and trade	Survey of 210 managers of Italian firms	2019–2020	Digital innovation (e. g., quality, innovativeness, etc.)	Knowledge generation capabilities; Knowledge acquisition capabilities; Market-sensing capabilities	Knowledge acquisition capabilities increase digital innovation; the impacts of knowledge generation and market-sensing capabilities are not significant.
Xie and Wu (2024)	How does competition policy affect enterprise digitization?	Multiple industry sectors	China's listed firms – 8159 observations	2004–2020	Enterprise digitalization commitment and innovation	Competition policy (Anti-Monopoly law)	While competition policy increases digitalization by alleviating monopoly power and facilitating talent mobility, it decreases digitalization by imposing compliance costs.

#### 2.4. The length of a record label's historical path and the speed at which it releases its first online digital music

Central to the organizational path dependence perspective (Sydow et al., 2009), the path-learning mechanism suggests that exploiting existing resources and capabilities is generally more efficient, reliable, and actionable than exploring new resources and capabilities (Audia & Goncalo, 2007; Sydow et al., 2020; Tang et al., 2012). Moreover, the path-synergy mechanism focuses on synergies that emerge from combining different but interrelated existing organizational resources and practices, thereby making the integration of incompatible new resources and practices costly and difficult (Schreyögg & Sydow, 2011; Sydow et al., 2009). We postulate that path-learning and path-synergy mechanisms underpin the impact of an organization's path dependence on the speed at which it adopts digital technologies. With the path-learning mechanism, we argue that organizations with lengthy historical paths have accumulated experience and knowledge, which enables them to efficiently leverage their traditional resources and competencies to perform organizational routines and extant practices.

Action patterns and organizational routines in path dependence are derived from the organizational learning process (Keller et al., 2022) and recursive reproduction (Schreyögg & Kliesch-Eberl, 2007). Accordingly, they are initially slow to explore the new resources, capabilities, and partnerships required for adopting digital technologies that significantly deviate from their routines and established practices. With the path-synergy mechanism, combining separate but interrelated organizational resources and practices creates significant barriers to adopting digital technologies. We elaborate on these mechanisms and develop arguments about the relationship between the length of a music record label's historical path and the speed at which it issues its first online digital release.

Specifically, the path-learning mechanism underpins the impact of path dependence on record labels with long historical paths for multiple reasons. From the path-learning perspective, the length of a record label's historical path is associated with the extent to which the label relies on entrenched resources, capabilities, and interfirm relationships and with the pervasiveness of internal structures and routines (BarNir et al., 2003). Record labels with lengthy historical paths have learned, from



**Table 3**  
Empirical Studies from the Organizational Path Dependence Perspective.

References	Research questions	Industry sectors	Research sample	Study period	Dependent variable	Independent variables	Key findings
Casillas et al. (2012)	What is the relationship between static patterns and the dynamic configurations of a firm's export behavior through the theoretical lens of <i>path dependence</i> .	Manufacturing	754 exporting firms	2002–2006	Dynamic configurations of a firm's export behavior later (export evolution, entry mode evolution and location evolution)	Static patterns of a firm's export behavior at a given time (export intensity, volume, entry mode, and location)	The <i>path-dependent</i> focus of internationalization—the set of exporting decisions adopted over a period—can be explained by the firm's export pattern at the start of that period.
Dasí et al. (2015)	Whether exploitative SMEs are more <i>path dependent</i> in their internationalization trajectories than explorative SMEs.	Manufacturing	132 Spanish SMEs	2000–2008	Management intentionality to internationalize (the increasing number of countries and growing foreign sales)	Exploitation orientation	Exploitative (as opposed to explorative) SMEs are <i>not more path dependent</i> in their international trajectories.
Greve and Seidel (2015)	How social information processes produce <i>path dependence</i> .	Transportation	21,432 aircrafts owned by 2,790 airlines	Pre–2012	Event of placing an order for an innovative aircraft design	Adoptions and abandonments by geographically proximate others	The information provided by early adoptions or abandonments can trigger an industry-level <i>path dependence</i> .
Manning et al. (2018)	How firm governance choices vary as a function of the time of adoption of particular sourcing practices.	Multiple	291 U.S., European and Australian firms.	1980–2011	Current governance choice for global business services sourcing	Initial governance decisions for global business services sourcing	Initial governance choices trigger firm-specific <i>path-dependent investments</i> into governance-specific capabilities that make the future use of those capabilities very likely.
Martínez-Noya and García-Canal (2011)	How firms' accrued technological capabilities resulting from <i>path-dependent learning</i> influence outsourcing and offshoring	R&D-intensive manufacturing	182 U.S. and European firms	2006	Outsourcing and offshore outsourcing R&D	Technological and governance capabilities	<i>Path-dependent learning</i> —accrued technological capabilities—leads to governance capabilities, thereby increasing outsourcing in general and offshore outsourcing R&D in particular.
Samuelsson et al. (2020) (Samuelsson, Söderblom, & McKelvie, 2020)	How an earlier funding choice affects later capital structures in startup firms.	Multiple	1,756 Swedish ventures	2012/2013 and 2016/2017	Subsidy ratio, debt ratio and equity ratio in 2016/2017	Subsidy ratio, debt ratio, and equity ratio in 2012/2013	<i>Path dependence</i> in new ventures' financial structures—their early funding choices of subsidies, debt, or equity, persist over time, with the strongest path effect for equity.
Shu and Wong (2018)	How shareholders will interpret a socially desirable action taken by firms with a damaged corporate reputation status.	Manufacturing	69 fraud-tainted donors and 473 clean donors	2001–2008	Cumulative abnormal returns around the donation announcements	Reputation enhancing actions (leader turnover, internal control systems, corporate philanthropy)	This study revealed the self-enforcing and <i>path-dependent</i> nature of the reputation repair process, in that firms that possess a better reputation status earlier will benefit more from donating.

their previous knowledge and experience, how to leverage best their existing resources, competencies, and value networks to distribute physical music releases efficiently. When digital technologies emerged, these record labels became reluctant to explore new resources and capabilities and engage in new partnerships (Saarikko et al., 2020). Moreover, a record label's decision on when to release its first digital music may be delayed due to the pervasiveness of its historically established organizational structures and routines, which may trigger internal conflicts between employees who are more experienced with digital technologies and those who are less digitally savvy (Nadkarni & Prügl, 2021). This internal conflict is more pronounced for record labels with long historical paths than those with short ones because the former's employees have spent many years learning to operate within traditional music value chains. Due to the resistance of less digitally experienced employees, record labels with lengthy historical paths tend to adhere to business models suitable for music releases in conventional formats (Mangematin et al., 2014). As a result, adopting digitalization and releasing online music in digital formats may be hindered.

Furthermore, the path-synergy mechanism underpins the impact of path dependence on a long-history record label and affects the speed at

which it issues its first digital music release because the long historical path enables the record label to combine the complementary distribution and promotion skills and capabilities of traditional releases, which enhances control over the traditional distribution networks (Moreau, 2013; Schreyögg & Sydow, 2011). Specifically, supplying music products to enthusiasts via conventional wholesalers and retailers in the pre-digital era required an extensive global distribution network. Compared to record labels with short historical paths, record labels with long historical paths can better afford the substantial investments and fixed costs needed to establish a vast distribution network. A large distribution network reduces distribution costs per physical music album sold, resulting in significant economies of scale. Similarly, record labels with long historical paths can achieve economies of scale in promotional activities. Traditional promotional activities via radio and TV broadcasting before the advent of ICTs and the Internet required substantial upfront marketing expenditure, which fueled the growth in physical music release sales and reduced promotion cost per unit sold (Moreau, 2013). Combining complementary distribution and promotion resources and skills leads to greater synergy in established practices, resulting in more substantial barriers to integrating digital distribution and

promotion networks that deviate significantly from historically entrenched practices and technologies. This complementarity between distribution and promotion activities provides positive feedback and increases returns, thereby reinforcing path-dependent behaviors and delaying the adoption of new technologies, such as digitalization in the music industry.

In short, we expect that the length of a record label's historical path has a negative impact on the speed at which it releases its first online music. This delay in technology adoption results from a complex interplay of factors, with path-learning and path-synergy mechanisms playing crucial roles. These self-reinforcing mechanisms underpin the impact of organizational path dependence on the speed of the first online music release. We therefore propose:

**Hypothesis 1 (H1):** The length of a record label's historical path is negatively associated with the speed at which it issues its first digital release.

### 2.5. The moderating effects of diversification

We argue that the negative relationship between the length of a record label's historical path and the speed at which it issues its first online music release is strengthened by international diversification and music format diversification, which reflects the diversity of geographic and product markets a record label must navigate. Prior research has shown that the diversification of geographic locations and product categories allows an organization to more effectively exploit its historically developed resources and capabilities in various international markets and multiple product lines by recursively accumulating knowledge and experience (Andreou et al., 2016; Mayer et al., 2015), thereby strengthening the learning mechanism of path dependence and delaying the adoption of a new technology. In the following, we elaborate on our arguments and develop hypotheses on these moderating effects.

International diversification suggests a firm's scope of expansion beyond its domestic market (Ghoshal, 1987) or "the extent to which a firm depends on foreign markets for customers, factors of production, and the capacity to create value" (Lu & Beamish, 2004, p. 565). It offers preemptive opportunities to reach prospective markets, attract new customers, and enable organizational growth on an international scale (Majocchi & Strange, 2012). Besides, expanding the business into diverse countries increases the firm value by, for example, achieving economies of scale and scope, exploiting excessive resources, enhancing market power, reducing risk, and providing financial benefits (Elango, 2004; Pennings et al., 1994). Prior studies have pointed out that international diversification drives the development and adoption of technology by offering organizations access to a broader range of technological innovations and expertise (Ghoshal & Bartlett, 1988; Hitt et al., 2006; Juergensen et al., 2022).

Despite this, we expect that international diversification may strengthen the negative effect of the length of a record label's historical path on its first digital music release. Central to this argument is the role of a record label's international diversification in strengthening the path-learning mechanism of organizational path dependence. Specifically, diversifying into multiple international markets enables organizations to accumulate experience and develop capability (Casillas et al., 2012; Hutzschenreuter et al., 2007; Martínez-Noya & García-Canal, 2011). As international diversification increases managerial complexity resulting from different customer demands, competition, and government regulations, it enables organizations to develop processes, routines, and practices for new market learning (Eisenmann, 2002; Kumar, 2009), which helps organizations exploit their historically accumulated resources and address the complexity of cultural, administrative, geographic, and economic diversity (Boehe & Jiménez, 2018). A high level of international diversification leads to further refinement of established processes, routines, and practices (Mayer et al., 2015), thereby enhancing path learning about the exploitation of existing resources and competencies while adapting to new market environments.

Record labels with lengthy (relative to short) historical paths usually exhibit more substantial international ambitions because they seek to exploit their intellectual copyright ownership on a larger scale by cultivating their music catalogs in new global markets (Bhattacharjee et al., 2007; Moreau, 2013). As they expand into multiple countries, record labels with long historical paths build an extensive global distribution network for conventional music releases. Moreover, long-history record labels with a high level of international diversification prior to the advent of digitalized music releases have learned how to use mass media channels such as radio and TV broadcasting and print media to promote and market music releases internationally (Moreau, 2013). Through international diversification, record labels with a long history have achieved substantial scale economies in conventional music product distribution and promotion by enlarging their size and through learning by doing. Because of cost benefits, record labels with a lengthy historical path may further invest in their traditional approaches, thereby forming a reinforcing loop and delaying the first online music release. In sum, we argue that a high level of international diversification strengthens path dependence through the path-learning mechanism and intensifies the negative impact of the length of a record label's historical path. We consequently expect the following:

**Hypothesis 2 (H2):** A record label's international diversification intensifies the negative relationship between the length of the label's historical path and the speed at which it issues its first digital music release.

*In the music industry, music formats are categories of music products, such as vinyl, cassette, and compact disc.<sup>2</sup> Music format diversification reflects the diversification of product markets that a record label has to navigate. Product diversification suggests that firms produce and sell in more than one product market (Van Kranenburg et al., 2004), and a high level of music format diversification implies that record labels operate across multiple product markets. Existing studies have indicated that product diversification has a positive impact on innovation and technological adoption (Mayer et al., 2015). Broad product lines enable firms to share R&D, manufacturing facilities, and marketing knowledge across different product lines (Ahuja et al., 2008; Kim et al., 2013). Moreover, a higher level of product diversification provides more significant learning opportunities and enhances the firm's ability to deal with new technologies and customers in fields of emerging technology (Benito-Osorio et al., 2012; Wiersema & Bowen, 2008). Prior studies have found that product diversification plays a vital role in adopting new technologies such as digitalization (Zanella et al., 2022).*

Despite its positive and direct effect on digitalization, product diversification does not necessarily weaken the negative effect of a lengthy historical path on the speed at which a record label issues its first digital release. In the base hypothesis (H1), we argued that music labels with a long historical path tend to take longer to release their first online music than record labels with a short historical path due to the path-learning mechanism underpinning the impact of path dependence. Specifically, record labels with lengthy historical paths have learned over many years how to efficiently market conventional releases to music enthusiasts via centralized distribution and promotion systems. Path learning prompts these record labels to further commit to traditional routines and procedures, which creates a positive feedback loop. The reason is that product diversification allows organizations to leverage their historically accumulated advantages across multiple product markets, and the ability to leverage product diversification opportunities effectively depends on an organization's experience and knowledge in product diversification (Kumar, 2009). High-level product diversification implies that an organization has recursively accumulated experience and knowledge about how its existing resources and capabilities can be better leveraged in multiple product markets, thereby strengthening the path-dependence effect of the long historical path and delaying the adoption of digital technologies. In this sense, the impact of

<sup>2</sup> Appendix B provides a brief introduction to music format.

path dependence via the path-learning mechanism becomes stronger for record labels with a high level of music format diversification before the advent of digital music than those with a low level. In sum, music format diversification strengthens the negative impact of the length of historical paths on the speed at which the first online music is released. Accordingly, we argue:

**Hypothesis 3 (H3):** Diversification of a record label's music format intensifies the negative relationship between the length of the label's historical path and the speed at which it issues its first digital music release.

## 2.6. The moderating effects of the degree of digitalization

The degree of digitalization of a record label's label type and home market reflects the extent to which peer organizations in the same music sector and from the same home market have adopted digital technologies. We postulate that the degree of digitalization of the label type and the home market intensifies the negative effect of the length of the historical path on the speed at which a record label releases digital music, because higher degrees of digitalization increase the barriers to matching the existing resources and capabilities with those required in the digital era, therefore strengthening the path dependence effect arising from the lack of synergy. Organizations may adopt new technologies more quickly if the technology-specific features are matched with their characteristics and resources and the industry and country milieu in which they operate (Depietro et al., 1990). If a mismatch exists, organizations with a lengthy historical path will tend to rely more heavily on conventional approaches, as integrating digital technologies requires long-term investments in hardware and software (Tang & Ho, 2019). In this sense, the degree of digitalization of peers in the music sector and the home market will strengthen the negative effects of a lengthy historical path on the first digital release, as elaborated below.

A label type is considered a subsector within the music industry. There are multiple label types, including major, indie, vanity, imprinting, genre-specific, and reissue (archive). Labels in different subsectors deploy digital technologies to transform their business models to different degrees (Chawla & Goyal, 2022). In highly digitalized music subsectors, labels develop digital resources and capabilities to shift from traditional to digital releases to a large degree (Li et al., 2018). Consequently, labels with long historical paths face greater pressure to adopt similar digital technologies to remain competitive in a sector surrounded by highly digitalized peers. However, rather than immediately embracing digital technologies, these labels typically strive to maintain their status quo and defend their market positions against digitalized industry peers by strengthening their traditional competitive advantages. The reason for this is that in a highly digitalized subsector, record labels with a long historical path often face significant challenges in synergizing their existing resources and capabilities with those that are essential for digital music distribution and promotion due to their overreliance on traditional business models and rigid organizational structures, routines, and cultures (Chesbrough, 2010; Sosna et al., 2010).

In highly digitalized label types, many peer labels release music on digital platforms, adopt digital marketing strategies, and promote artists' work through unconventional channels. To thrive in a digital age, record labels with lengthy historical paths need to familiarize themselves with digital distribution procedures, online playlist placements, and algorithms central to different digital platforms. They must deal with a number of changes, such as new resources for effectively using various online platforms to interact with customers and new competencies for managing digital rights and analytics. Thus, it is challenging to combine two distinct approaches, thereby inhibiting the synergy effect and leading to a stronger path dependence effect. Therefore, we expect:

**Hypothesis 4 (H4):** The degree of digitalization of a label type where a record label resides intensifies the negative relationship

between the length of the label's historical path and the speed at which it issues its first digital music release.

*The degree of digitalization of a record label's home market reflects the extent to which home-market peers have adopted and embraced digital technologies (Lythreitis et al., 2022). Prior research has pointed out that home countries with a high degree of digitalization are likely to possess a well-developed digital operating environment characterized by supportive digital policies and regulations, available capital, robust technology infrastructure, and a technologically adept population (Lythreitis et al., 2022). These could facilitate the country-level and firm-level adoption of digital technologies (Ahmadova et al., 2022; Romero-Martínez & García-Muñia, 2021). Nevertheless, these pro-digitalization factors may not alleviate the negative impact of a record label's lengthy historical path on digitalization. We argue that the degree of digitalization of a record label's home market may intensify the path dependence impact on record labels with a lengthy historical path and delay their first online music release due to the mismatch between specific features of new digital technologies and the label's long-established resources and capabilities.*

In home countries with high degrees of digitalization, highly digitalized peers in the home market have shifted from traditional to digital business models by developing digital capabilities, creating new customer segments, offering digital products and services, and employing digital marketing channels. Accordingly, the higher the degree of digitalization of peers in the home market, the more developed the digital environment is, which would render the traditional business approaches of record labels with lengthy historical paths obsolete in the home market (Kask & Öberg, 2019). Consequently, record labels in highly digitalized home countries face even greater challenges in leveraging disruptive digital technologies to remain competitive in the home market. When the levels of such challenges increase, record labels with a long (relative to short) historical path may be more reluctant to embrace new digital opportunities, such as online music distribution and promotion, due to significant barriers to achieving synergy between their traditional resources and competencies, which revolve around controlling the entire music value chain, and those required for digital approaches, such as pay-per-download and subscription-based services (Berg, 2022; Urbinati et al., 2019).

Furthermore, while a higher degree of home-country digitalization usually comes with a broader range of digital technologies adopted by home-country peers, record labels with a lengthy historical path may be more hesitant to release their music catalog on digital platforms than record labels with a shorter historical trajectory due to the lack of technological knowledge in determining which digital technologies and platforms align most with their historical resources and competences (Moreau, 2013). To release music online, a record label needs a thorough understanding of available online music platforms and must be able to convert analog music formats to digital music formats that align with the online platform's technical specifications. In this respect, there are many uncertainties and technical difficulties with copyright, file sizes, sound quality, and metadata. Thus, converting physical to digital music products involves a complex translation across technology standards and conventions (Geurts & Cepa, 2023). When such new digital technologies are significantly more advanced than long-history labels can adopt and comprehend, these record labels will take longer to synergize their existing resources and capabilities with the specific features of digital technologies.

To summarize, the degree of digitalization in a record label's home market intensifies the path dependence effect and delays technology adoption because it heightens the mismatch between traditional and digital approaches and increases the complexity of understanding the specific features of digital technologies. This, in turn, prolongs the time taken by record labels with a lengthy historical path to release their first online music. Therefore, we posit:

**Hypothesis 5 (H5):** The degree of digitalization in a record label's home market intensifies the negative relationship between the length of the label's historical path and the speed at which it issues its first digital

music release.

Fig. 1 illustrates our theoretical arguments.

### 3. Methods

#### 3.1. Research sample

To test the hypotheses, we collected information on music releases from the MusicBrainz database (<https://metabrainz.org/>). The database is an open source of music information, which provides music-related metadata worldwide and stores information about artists, works of art, and art events. This database has recently been used to answer management and strategy-related questions (e.g., Berg, 2022; Shi, 2023; Zanella et al., 2022). It is managed by two independent organizations (i.e., the Music Technology Group and the Universität Pompeu Fabra) and facilitated by leading high-tech multinational enterprises such as Google, Microsoft, and Amazon, as well as leading music corporations such as Universal Music and Spotify. More importantly, all information in the database is maintained by over two million online editors worldwide, who strictly check the reliability and accuracy of the data. Differing from previous studies on the music industry in a single country (e.g., the United States, Berg, 2022; South Korea, Lee & Gargiulo, 2021), we collected data on music labels and their releases worldwide to address the globalization feature of music and seek evidence for our hypotheses. In the music database, a music release is a music recording made publicly available by a record label on a specific medium. The media can be vinyl, CD, digital online, and suchlike. In this study, we define a digital release as a music recording that is accessible on an online platform (e.g., Napster and iTunes) rather than releases available on physical media (e.g., CD and MP3). Although recordings on CD are sometimes considered digital music (Adner et al., 2019), we distinguish them from recordings that are downloadable and accessible via the Internet and that reflect the recent technical transition in the music industry (i.e., from physical media to digital networks; Benner & Waldfoegel, 2016). Moreover, this study identifies the starting year of digital releases as 2000, as the first music-sharing website emerged in 1999 for unofficial music recordings (Benner & Waldfoegel, 2016; Brewster, 2021). In line with the historical timeline of digital releases, we included record labels established before 2000 to ensure theoretical consistency between the research sample and our path dependence-related arguments.

Furthermore, we collected information about record labels' home markets from the World Development Indicator (WDI) database maintained by the World Bank. The WDI data allowed us to control for national influences on a record label's digital releases (Baller et al., 2016), as elaborated below. After integrating the information on record labels and their releases with their home-market information, we removed observations with missing values for critical variables. The analytic dataset includes 17,314 organization-year observations, featuring 1,532

first digital releases by 5,129 record labels in 68 countries between 2000 and 2018.

#### 3.2. The analytic approach and dependent variable

Given the focus on the speed of a record label's first digital release, this study employed Cox proportional hazard regression estimation to conduct a set of survival analyses (Hosmer et al., 2008). Such analyses examine an event (e.g., in this study, the first digital release of a record label) and the year(s) taken by the record label to make the event happen. Using the Cox model, we estimate the effects of explanatory variables on the event's hazard (i.e., the likelihood of occurrence). Compared to parametric survival-time models, the Cox model does not need to specify the distribution of the event hazard but ranks observational units (e.g., record labels) and maximizes the partial likelihood that a record label makes an event happen with conditions of the organization's characteristics at the time of the event (Hosmer et al., 2008). In addition, the integration of duration factors into the estimation allows the Cox model to correct censored data, such as record labels that did not publish an Internet release at the end of the time window (Cox, 1972).

In the survival analysis, the dependent variable is the event and its pre-occurrence duration. For example, when a record label releases a digital recording online, we code the event as 1, and this label is subsequently excluded from the analysis. The duration of the record label's first digital release is the number of years between the year of the first digital music platform and the year of the organization's first digital release (or the end of the time window). This measurement approach has been used in prior research on speed-related analyses (e.g., Lamberg & Peltoniemi, 2020; Tang, 2023; Zhou & Park, 2020).

#### 3.3. Explanatory variables

We measured the independent variable *the length of a record label's historical path* as the years that lapsed after the record label's incorporation (Shinkle & Kriauciunas, 2010). Given the skewed distribution of historical length values, we log-transformed this measurement to approximately conform to normality. Furthermore, in the hypotheses, we propose a set of moderating effects that may alter the impact of historical length on the speed of a record label's first digital release. The first moderator is *international diversification*. We measured this as the entropy of a record label's exposure to the global market as per the formula below:

$$InternationalDiversification_{it} = \sum_{k=1}^n p_{kt} \times \ln \frac{1}{p_{kt}} \tag{1}$$

where *international diversification* is the entropy value of a record label *i* at time *t*.  $p_{kt}$  is the proportion of the focal organization's releases

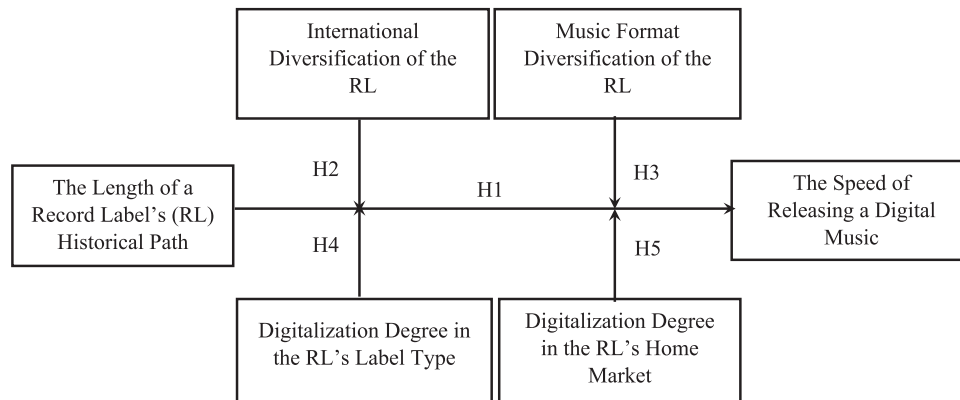


Fig. 1. Conceptual model.



in one country  $k$  to all releases worldwide. Past studies have used this approach to measure diversification-related concepts (e.g., Belderbos et al., 2020; Tang & Yang, 2024).

The second moderator, *music format diversification*, measures the diversification of medium formats in which a record label has released its music products. We calculated the entropy of the record label's medium format by the following formula:

$$\text{MusicFormatDiversification}_{it} = \sum_{j=1}^n p_{jt} \times \ln \frac{1}{p_{jt}} \quad (2)$$

where *music format diversification* is the entropy value of a record label  $i$  at time  $t$ .  $p_{jt}$  is the proportion of the focal organization's releases in one medium format  $j$  to its releases in all medium formats.

Furthermore, we measured the *degree of digitalization of the label type* as the ratio of digital releases to all releases by record labels in the label type where a focal record label is affiliated. Likewise, we measured the *degree of digitalization in the home market* as the ratio of digital releases to all releases in the focal record label's home market.

### 3.4. Control variables

The speed of a record label's first digital release may be affected by factors other than the explanatory variables mentioned above. Therefore, we controlled for a number of confounding effects. First, prior research has found that organizational size may affect a firm's strategic movement (Shinkle & Kriauciunas, 2010). Thus, we controlled for *record label size* by measuring the number of releases by a record label in a year. Furthermore, because the organizational culture may affect a record label's activities, such as the adoption of digitalization (Ouchi & Wilkins, 1985), we controlled for *music organization language diversity* to reflect the nature of the music industry in the era of digitalization (Chatman & Jehn, 1994; Hougaard & Tvede, 2010). This variable is measured as the entropy of each label's release languages.

We considered the *economic growth* of a record label's home market because a well-developed economy may have better technology to facilitate digitalization (Baller et al., 2016). This control variable is measured as the annual growth rate of a country's gross domestic product (GDP). In addition, as digital releases rely on the Internet (IFPI, 2022), we controlled for the home market's *Internet usage* by measuring it as the percentage of the population who use it. Moreover, given the technical requirements of digital music (Koh et al., 2019), we controlled for the home market's *technicians in R&D*. We measured this control as the number of R&D technicians per million people in a country. We also noted that record labels and their releases are protected by different property legislations across countries, which directly determines how record labels release music recordings (Coyle et al., 2009; Sinha & Mandel, 2008). Thus, we controlled for *legal protection of property rights* and measured this as the legal system and property rights dimension of the Economic Freedom Index. This index has been used to examine intellectual property protection in the literature (e.g., Yan et al., 2022). In addition to the music industry's legal conditions, the institutional environments where record labels reside may also affect their adoption of digitalization. We took both formal and informal institutions into consideration. The former are *regulatory environments*. We collected these data from the regulation dimension of the Economic Freedom Index, which reflects a country's regulatory quality that affects the freedom of exchange on the market (Aguilera & Grøgaard, 2019). Regarding the effect of informal institutions, we controlled for *uncertainty culture* and measured it as the uncertainty dimension of a country's Hofstede culture values (Hofstede et al., 2010). The rationale is that record labels from a culture with a high level of uncertain preference may adopt digitalization quickly.

To control for unobservable effects of country, label type, and year, we included dummies for the country, label type, and year in the regression models. Also, to control for spurious associations, we lagged

time-varying explanatory variables by one year (Hair et al., 2010).

## 4. Results

Table 4 presents descriptive statistics and a correlation matrix showing the key variables and their relationships. Since high correlations were observed between several variables, variance inflation factors (VIFs) were calculated to test for multicollinearity. The largest VIF was 3.55, and the mean VIF was 1.89. Both are substantially below the rule-of-thumb cutoff (10), minimizing multicollinearity concerns (Ryan, 1997).

Table 5 reports the results of the Cox regressions. Model 1 is the baseline model and includes all the control variables. Models 2–6 sequentially add the independent variable and its interaction terms with moderators. Model 7 is the full model with all the variables and interaction terms. The gradually increased log pseudolikelihood and Wald chi-squared values indicate the explanatory power of these models. The coefficients of key variables, their p-values, and their 95 % confidence intervals (CIs) reported in these models provide the criteria for hypothesis testing.

Specifically, Hypothesis 1 predicts that record labels with lengthy historical paths release digital recordings online more slowly than those with short historical paths. In Model 2, the coefficient of *record label length of a historical path* is negative and statistically significant ( $\beta = -2.238, p < 0.001, CI = -2.380 | -2.097$ ), indicating that each 2.718-year (i.e.,  $e^1$ ) increase in a record label's historical path will result in a decreased probability of the first digital release by 89.34 % (i.e.,  $e^{-2.238} - 1$ ). In other words, we found that the older record labels took longer than the younger ones to initiate digital releases after the online music platform emerged. This effect remains in Models 3–7 when interaction terms are included. Thus, Hypothesis 1 is supported.

Furthermore, Hypothesis 2 argues that the record label's international diversification intensifies the negative impact of the historical path's length on the speed of a record label's first digital release. In support of this argument, Model 3 presents a negative and marginally significant coefficient of the interaction between the *length of the historical path* and *international diversification* ( $\beta = -0.653, p < 0.005, CI = -1.074 | -0.231$ ). This result suggests that an increase in *international diversification* will strengthen the negative impact of the length of the historical path on digital release speed. Consequently, this finding supports Hypothesis 2. In Hypothesis 3, we propose that *music format diversification* strengthens the relationship between the length of historical paths and the speed of digital adoption. Model 4 shows a negative and statistically significant effect of the interaction term between the *length of the record label's historical path* and *music format diversification* ( $\beta = -0.781, p < 0.001, CI = -1.182 | -0.380$ ). In this sense, *music format diversification* strengthens the negative impact of the length of the historical path on the speed of the first digital release. This effect is also observed in Model 7, in which all the interaction terms are included. These findings deliver support for Hypothesis 3.

Likewise, Hypothesis 4 gains support in Model 5, in which the coefficient of the interaction between the *length of the historical path* and the *degree of digitalization of the label type* is negative and statistically significant ( $\beta = -4.971, p < 0.001, CI = -5.945 | -3.997$ ). When all the interaction terms are included in Model 7, this negative and significant effect remains, suggesting that the *degree of digitalization of the label type* strengthens the negative impact of the length of the historical path on the speed of digital release. Model 6 of Table 5 provides support for Hypothesis 5, which postulates that the *degree of digitalization of the home market* amplifies the negative impact of the length of the historical path on the speed of the first digital release. Model 6 shows a negative and statistically significant coefficient of the interaction term between the *length of the historical path* and the *degree of digitalization of the home market* ( $\beta = -4.570, p < 0.001, CI = -5.465 | -3.675$ ), suggesting that the degree of digitalization of the home market strengthens the negative relationship between the length of a record label's historical path and



**Table 4**  
Descriptive statistics and correlations<sup>a</sup>.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Duration	1													
2 The length of the label's historical path	0.460	1												
3 International diversification	-0.035	0.068	1											
4 Music format diversification	0.001	0.016	0.160	1										
5 Degree of digitalization of the label type	0.777	0.399	-0.018	0.025	1									
6 Degree of digitalization in the home market	0.749	0.392	-0.003	0.007	0.786	1								
7 Music organization size	-0.126	0.132	0.161	0.192	-0.067	-0.085	1							
8 Music organization language diversity	-0.069	0.061	0.103	0.113	-0.013	-0.037	0.426	1						
9 Economic growth	-0.221	-0.158	-0.007	-0.032	-0.183	-0.209	0.005	0.007	1					
10 Internet usage	0.637	0.448	0.033	0.072	0.557	0.552	0.025	-0.026	-0.339	1				
11 Technicians in R&D	0.178	0.099	0.046	-0.006	0.161	0.274	-0.059	-0.012	-0.181	0.492	1			
12 Legal protection of property rights	0.033	0.052	0.046	0.066	-0.012	0.014	0.010	-0.037	-0.227	0.551	0.551	1		
13 Regulatory environments	0.190	0.101	0.035	0.024	0.108	0.126	-0.008	-0.096	-0.027	0.391	0.184	0.382	1	
14 Uncertainty culture	-0.130	-0.106	-0.069	-0.019	-0.057	-0.171	0.082	0.125	0.033	-0.393	-0.259	-0.506	-0.445	1
Mean	8.338	2.500	0.011	0.021	0.129	0.089	1.290	0.032	2.174	56.421	6.756	7.428	7.387	67.396
SD	4.170	0.849	0.051	0.061	0.135	0.105	0.714	0.078	2.784	24.612	0.642	1.062	0.932	21.481
VIF	-	1.410	1.060	1.070	3.142	3.161	1.332	1.248	1.180	3.551	1.702	2.655	1.387	1.638

<sup>a</sup> Correlation coefficients with absolute values greater than 0.025 are statistically significant at  $p < 0.001$ .  $N = 17,314$ .

the speed at which it issues its digital release. Model 7 confirms this effect and provides additional evidence.

Fig. 2 illustrates the four moderating effects in four panels by plotting both the high level (i.e., 1 SD below the maximum) and the low level (i.e., 1 SD above the minimum) of a moderator in the same panel. We note that while the speed at which a record label issues its first digital release declines at the increase of the length of its historical path, such decline is stronger (i.e., a steeper slope) when a moderator is at the high level (the solid line) but weaker (i.e., a flatter slope) when the moderator is at the low level (the dashed line). Moreover, we visualized the effect size of moderating effects in Fig. 3, demonstrating a moderator's impact on the historical path – speed relationship and its 95 % CIs. In each panel of Fig. 3, we found that the impact of historical path length on digitalization speed decreases at the increase of every moderator, and the CIs of this decreasing effect do not go through the horizontal zero line. Thus, these figures provide additional evidence for the hypothesized moderating effects.

#### 4.1. Supplementary analyses

Three sets of additional analyses were conducted to test the robustness of the empirical findings. First, we examined whether the inclusion of large record labels may bias our empirical analyses. The music market has three major record labels (Universal Music Group, Sony Music Entertainment, and Warner Music Group). They own and hold joint shares in a large number of independent record labels. We identified and excluded record labels that are affiliated with and directly controlled by the three major organizations. After that, we reran the Cox regression model with the subsample. Second, our main test relies on a semi-parametric model (i.e., the Cox proportional hazard regression) for its flexible assumption about hazard distributions. However, it is possible that a specified distribution may show different results. Thus, we estimated a parametric regression survival-time model by assuming a Weibull survival distribution. Third, there may be endogenous effects on a record label's historical path, and we addressed the endogeneity by adopting an instrumental variable approach. This approach calculates the instrumental variable by a higher-level endogenous variable (e.g., the industry level, Wang et al., 2022). As a record label lies within a specific label type (a subsector of the music industry), we measured the instrumental variable as the average age of record labels within the same label type. After that, we used a two-stage residual inclusion estimation by including the first-stage residuals as a control variable in the second-stage Cox model (Li et al., 2015). Table 6 presents the results of the three robustness tests, which are broadly consistent with those used for testing the hypotheses.

#### 5. Discussion and Conclusion

The recent trend of digitalization has reshaped the landscape of strategic management. Whereas many organizations adopt digital strategies to enhance business performance, others are not keen on digitalization and are inclined to digitalize slowly. In the context of the long history and global scale of the music industry, this study reveals how the length of a music record label's historical path may negatively impact the speed at which it issues its first digital music release and how this negative impact may be exacerbated by the diversification of product and geographic markets (i.e., diverse music formats and diverse international locations) as well as the degree of digitalization of the music subsector (i.e., the label type) and the home market. Our findings extend scholarly understanding of the impact of organizational path dependence on an organization's adoption of new technologies, demonstrating that the length of a record label's historical path underpins its path dependence due to path learning and path synergy. We clarify that geographic and product diversification enables record labels to exploit historically developed advantages by accumulating experience, thereby strengthening the learning from historical paths and delaying the

**Table 5**  
Cox regression models <sup>a</sup>.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Music organization size	0.467 (0.048) [0.000]	0.431 (0.044) [0.000]	0.473 (0.046) [0.000]	0.483 (0.044) [0.000]	0.407 (0.044) [0.000]	0.415 (0.044) [0.000]	0.488 (0.046) [0.000]
Music organization language diversity	0.610 (0.365) [0.095]	0.400 (0.346) [0.247]	0.470 (0.345) [0.173]	0.486 (0.342) [0.156]	0.416 (0.345) [0.229]	0.401 (0.347) [0.248]	0.565 (0.343) [0.100]
Economic growth	0.007 (0.013) [0.595]	-0.003 (0.013) [0.833]	-0.003 (0.013) [0.804]	-0.002 (0.013) [0.901]	0.000 (0.013) [0.997]	0.000 (0.013) [0.981]	0.001 (0.013) [0.937]
Internet usage	0.003 (0.003) [0.245]	0.045 (0.004) [0.000]	0.045 (0.004) [0.000]	0.045 (0.004) [0.000]	0.039 (0.004) [0.000]	0.041 (0.004) [0.000]	0.040 (0.004) [0.000]
Technicians in R&D	-0.034 (0.089) [0.704]	-0.337 (0.091) [0.000]	-0.350 (0.093) [0.000]	-0.343 (0.091) [0.000]	-0.337 (0.090) [0.000]	-0.283 (0.091) [0.002]	-0.343 (0.093) [0.000]
Legal protection of property rights	-0.556 (0.167) [0.001]	-0.519 (0.151) [0.001]	-0.491 (0.151) [0.001]	-0.521 (0.151) [0.001]	-0.507 (0.149) [0.001]	-0.567 (0.149) [0.000]	-0.498 (0.148) [0.001]
Regulatory environments	-0.149 (0.099) [0.133]	0.045 (0.091) [0.623]	0.072 (0.092) [0.431]	0.035 (0.091) [0.703]	-0.024 (0.091) [0.795]	-0.032 (0.090) [0.726]	-0.013 (0.092) [0.885]
Uncertainty culture	-0.069 (0.070) [0.330]	-0.121 (0.066) [0.066]	-0.138 (0.067) [0.038]	-0.117 (0.066) [0.076]	-0.078 (0.066) [0.235]	-0.070 (0.063) [0.260]	-0.077 (0.064) [0.226]
International diversification (ID)	0.106 (0.556) [0.849]	0.301 (0.508) [0.554]	0.824 (0.564) [0.145]	0.157 (0.523) [0.765]	0.369 (0.486) [0.448]	0.331 (0.498) [0.506]	0.805 (0.558) [0.149]
Music format diversification (MED)	7.186 (0.293) [0.000]	6.519 (0.270) [0.000]	6.448 (0.270) [0.000]	6.873 (0.272) [0.000]	6.516 (0.271) [0.000]	6.479 (0.273) [0.000]	6.716 (0.277) [0.000]
Degree of digitalization of the label type (DDLT)	0.752 (0.500) [0.132]	1.782 (0.469) [0.000]	1.729 (0.469) [0.000]	1.795 (0.466) [0.000]	17.060 (1.494) [0.000]	2.304 (0.447) [0.000]	13.285 (1.976) [0.000]
Degree of digitalization in the home market (DDHM)	2.841 (0.523) [0.000]	3.071 (0.503) [0.000]	3.101 (0.506) [0.000]	3.093 (0.505) [0.000]	3.200 (0.509) [0.000]	16.554 (1.375) [0.000]	9.258 (2.005) [0.000]
H1: The length of the label's historical path		-2.238 (0.072) [0.000]	-2.238 (0.072) [0.000]	-2.247 (0.073) [0.000]	-2.199 (0.073) [0.000]	-2.219 (0.074) [0.000]	-2.211 (0.074) [0.000]
H2: The length of the label's historical path × ID			-0.653 (0.215) [0.002]				-0.674 (0.211) [0.001]
H3: The length of the label's historical path × MFD				-0.781 (0.204) [0.000]			-0.611 (0.204) [0.003]
H4: The length of the label's historical path × DDLT					-4.971 (0.497) [0.000]		-3.700 (0.664) [0.000]
H5: The length of the label's historical path × DDHM						-4.570 (0.457) [0.000]	-2.032 (0.673) [0.003]
Log pseudolikelihood	-10,483	-9,927	-9,918	-9,916	-9,856	-9,874	-9,833
Wald chi-squared	57,047	56,071	52,367	53,079	57,639	53,039	48,438

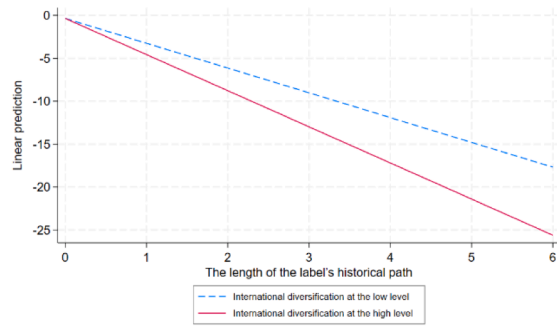
<sup>a</sup> Number of observations = 17,314, number of record labels = 5,129, number of first digital releases = 1,532, robust standard errors (record label clustered) in parentheses, p-values in brackets; Country-, label type-, and year-dummies included.

adoption of new knowledge. We also show that a greater degree of digitalization of peers in the subsector and at home increases the barrier to matching organizational and external resources, therefore strengthening the synergy of historical paths and delaying the adoption of new knowledge.

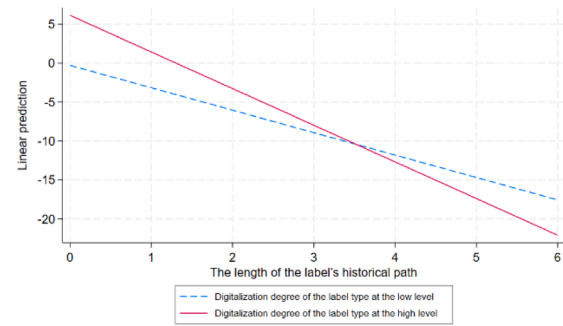
### 6. Theoretical contributions

Our study contributes to the strategy literature with novel nuances of the impact of path dependence on organizations' adoption of breakthrough innovation. In response to the call for research on the underpinning mechanisms of organizations' path-dependence behaviors (Sydow et al., 2009, 2020), we advance prior research that has conceptualized organizational path dependence as the limited ability of organizations to adapt offerings, processes, structures, and routines to

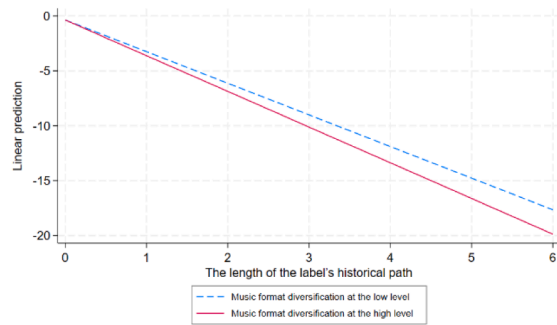
new changes in the environment, thus demonstrating a negative impact of the length of an organization's historical path on the speed at which it adopts digitalization. Although this finding is consistent with the conventional wisdom about an organization's historical path, it goes beyond the historical impact by offering new evidence for its underpinning mechanisms. By incorporating a temporal dimension into the organizational path dependence perspective, we argue that the effect of the path's length is rooted in the path-learning and path-synergy mechanisms. The accumulation of experience and knowledge over a long period reinforces positive feedback in the previous path and leads organizations to continue the existing path (BarNir et al., 2003; Beckman & Burton, 2008; Gruber, 2010). Moreover, combining complementary skills with existing resources for a long period makes organizations hesitant to deviate from the existing path and willing to stay on the existing path (Schreyögg & Sydow, 2011; Sydow et al.,



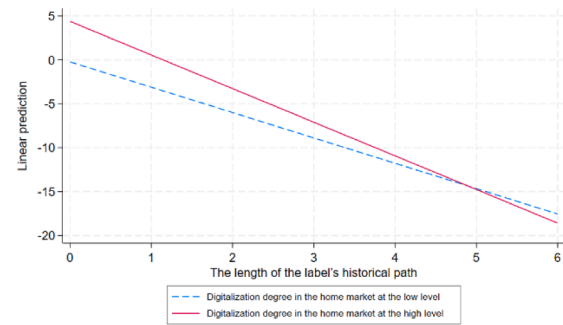
(a) International diversification



(c) Degree of digitalization in the label type



(b) Music format diversification



(d) Degree of digitalization in the home market

Fig. 2. Moderating effects of moderators at the low and high levels.

2009).

Furthermore, past studies on organizational path dependence have focused on the scope of organizational strategic patterns that narrow over time and become extremely limited in one strategic scope of actions during the process of self-reinforcement (Sydow et al., 2009, 2020). Our findings extend these studies by showing that organizational path-dependent behavior is not only affected by an organization's past scope of actions and its evolvement over time, as previous literature has indicated (e.g., Sydow et al., 2009), but also by the organization's historical path.

In addition, we contribute to the extant literature on organizational path dependence with nuanced evidence for the theoretical boundary of path dependence impacts. This evidence was obtained by distinguishing the path-learning and path-synergy mechanisms underpinning these impacts. Specifically, while international diversification and music format diversification strengthen the impact of path dependence through path learning (i.e., learning to exploit existing resources and capabilities in diversifying processes; Andreou et al., 2016; Mayer et al., 2015), the high degree of digitalization of the label types and the home market intensifies this impact by hindering path synergy (i.e., combining digital and conventional resources and capabilities; Schreyögg & Sydow, 2011; Sydow et al., 2009). As such, our study reveals the condition under which the path dependence impact is altered and the distinct mechanisms that are behind this impact. Despite its identical consequences (i.e., the delay to digitalization), the underlying mechanisms differ (i.e., path learning or path synergy).

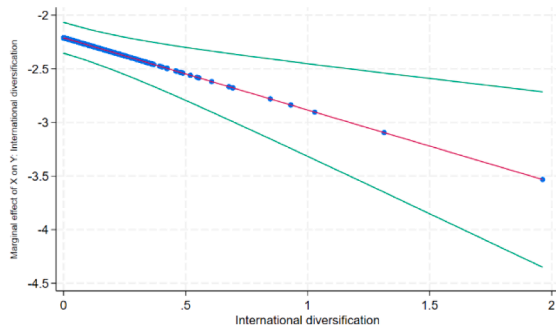
### 6.1. Managerial implications

Path dependence and its consequence of lock-ins are highly relevant to strategic management and organizational decision-making. Our findings reveal important implications for managers. While the advent

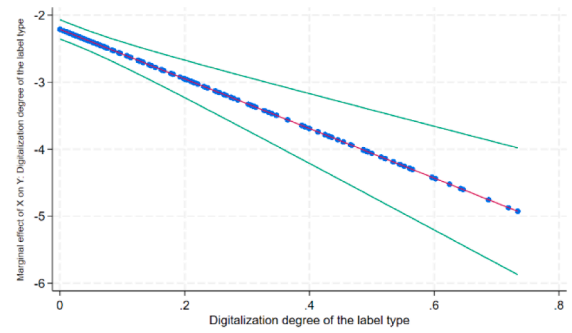
of digital technologies such as the Internet and ICT has disruptive and transformative features and can significantly impact the music industry's traditional approaches, our findings confirm that the speed at which digitalization is adopted is determined by the length of an organization's historical path, and this determining effect varies across organizations that have diversified their geographic and product markets at different levels and that are surrounded by peers with varying degrees of digitalization.

Managers of record labels are advised to concede to digitalization's disruptive and transformative nature as well as its challenges to conventional approaches in the music industry. Embracing digital technologies offers record labels novel ways to distribute their music releases to a broader audience, thereby increasing revenue and enhancing music fan engagement. For example, in 2023, Warner Music Group agreed to expand the scope of its licensing agreement with TikTok Music—a subscription streaming service recently launched in Brazil and Indonesia, with plans for further growth in other markets—and TikTok's Commercial Music Library. This agreement facilitated new music releases and licensed the extensive music repertoire from Warner Recorded Music and Warner Chappell Music to TikTok's platform, thereby enabling Warner Music Group and its artists to further tap into TikTok's revenue generation and promotional capabilities, as well as TikTok's rapidly growing user community worldwide (Leight, 2024). In this sense, the advent of the Internet and social media networks (e.g., Facebook, Instagram, and Twitter) has resulted in powerful promotional tools that have "shaken off" classical media, such as TV and radio. Ignoring disruptive digital technology is detrimental to the core competitive advantages of record labels with a long historical path and their ability to create value for music consumers and capture part of their values for themselves in the digital era.

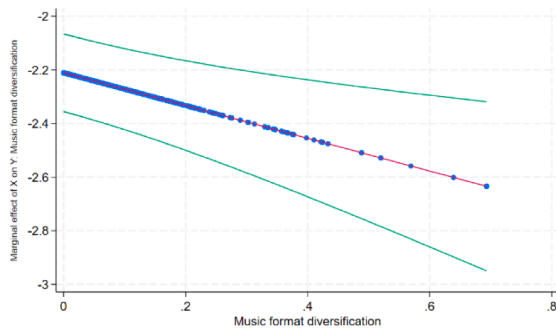
Furthermore, digital, Internet, and mobile technologies have undoubtedly changed how music consumers find and enjoy music, thus



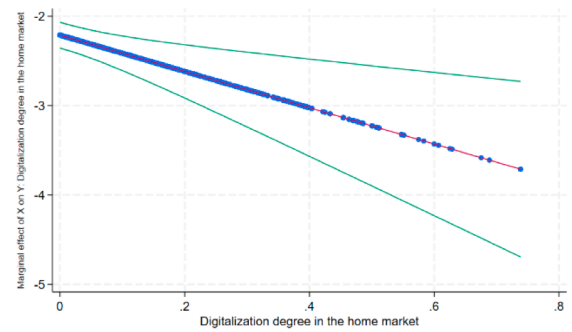
(a) International diversification



(c) Degree of digitalization of the label type



(b) Music format diversification



(d) Degree of digitalization in the home market

Fig. 3. Effect size of moderators at different levels.

opening for various possibilities. Rather than abandoning traditional approaches altogether, record labels with a long historical path can rethink what they can do better with new digital technologies that complement the competitive advantages that have been developed historically. Our study recommends that managers embrace digital disruptions with a balanced approach to innovation and tradition. Interestingly, in 2021, vinyl and CD sales in the U.S. increased for the first time in almost two decades, contributing to 10 percent of the total revenue from all formats during 2021–2023 (RIAA, 2023). This resurgence of vinyl and CD was driven by both nostalgic fans reclaiming their youth and young generations discovering vinyl for the first time. In 2017, Sony Music Entertainment started making vinyl again at its sole record-making factory, Toyokasei. In the same year, Universal Music Enterprise created the Sound of Vinyl, which provides a personalized and curated platform for discovering and buying vinyl records. Despite being a limited fraction of the total revenue, vinyl and CDs are usually priced higher than digital downloads, potentially offering a higher profit margin. Long-established record labels, such as Atlantic Records, Sony, and EMI-Universal, have turned themselves into 360-degree music companies to engage in a wide range of value-capturing activities such as physical music sales, digital music distribution, music licensing, sponsorships, merchandising, and touring and live music performance (Marshall, 2013).

In addition, managers of record labels with a long history are advised to pay attention to the fact that over-diversification (i.e., international diversification and music format diversification) will further delay the speed at which technology is adopted. Therefore, finding an optimal level of international or product diversification is important. Our findings also suggest that operating in a highly digitalized industry sector or home market may not necessarily guarantee the successful integration of digital technology into existing business models. Managers of record labels should carefully acquire complementary resources and

capabilities that can synergize the value of historical traditions with the advantage of cutting-edge approaches. The empirical evidence of our study offers an actionable approach to evaluating a record label's readiness for digital transformation regarding the length of its historical path. Fig. 3c, for example, indicates that an increase in the label type's degree of digitalization from zero to 0.1 will strengthen the negative impact of a record label's historical path on the speed of digitalization by about 0.42. By integrating the evidence in Fig. 2c, this finding suggests that when a record label becomes 2.718 (i.e.,  $e^1$ ) years older, its digitalization speed may be reduced by 2.87; in the meantime, if the record label operates within a label type that has digitalized at the 0.1 higher degree, the record label will delay digitalization extra 1.2 years. Based on the empirical findings, our theoretical argument suggests that if managers of a record label with a lengthy historical path would like to release the label's digital music quickly, and if the cost of entering a new subsector is lower than that of handling the mismatch between organizational and external resources in extant subsectors, they may consider moving to another label type with a lower degree of digitalization. Doing so will enable these record labels to leverage the advantages accumulated in their long historical path.

### 6.2. Policy implications

Our findings hold important implications for policymakers. First, effective policies and supportive regulations can reduce the complexity and uncertainty of operating in unfamiliar geographic locations and unrelated digital product markets, thereby facilitating the transition from physical to digital music recordings. With appropriate policy support, record labels with lengthy historical paths can reallocate resources to digitalization more efficiently. Moreover, to maximize the benefits of digitalization across countries and music sectors, policymakers may design measures that encourage collaboration and the

**Table 6**  
Robustness tests.

	Model 8	Model 9	Model 10
Music organization size	0.522 (0.048) [0.000]	0.508 (0.046) [0.000]	0.525 (0.080) [0.000]
Music organization language diversity	0.427 (0.360) [0.235]	0.452 (0.356) [0.204]	0.460 (0.353) [0.192]
Economic growth	0.003 (0.013) [0.822]	-0.001 (0.013) [0.955]	0.002 (0.013) [0.844]
Internet usage	0.039 (0.004) [0.000]	0.046 (0.004) [0.000]	0.039 (0.007) [0.000]
Technicians in R&D	-0.324 (0.098) [0.001]	-0.360 (0.100) [0.000]	-0.335 (0.114) [0.003]
Legal protection of property rights	-0.462 (0.151) [0.002]	-0.530 (0.149) [0.000]	-0.524 (0.144) [0.000]
Regulatory environments	-0.010 (0.093) [0.914]	-0.011 (0.094) [0.903]	-0.025 (0.096) [0.796]
Uncertainty culture	-0.051 (0.063) [0.420]	-0.046 (0.063) [0.461]	-0.044 (0.061) [0.474]
International diversification (ID)	0.534 (0.543) [0.325]	0.908 (0.547) [0.097]	0.867 (0.628) [0.168]
Music format diversification (MED)	6.709 (0.280) [0.000]	6.672 (0.282) [0.000]	6.664 (0.364) [0.000]
Degree of digitalization of the label type (DDLTL)	14.012 (2.049) [0.000]	15.397 (1.956) [0.000]	13.834 (1.997) [0.000]
Degree of digitalization in the home market (DDHM)	7.921 (2.043) [0.000]	9.896 (1.897) [0.000]	8.760 (2.023) [0.000]
The length of the label's historical path	-2.194 (0.076) [0.000]	-2.491 (0.088) [0.000]	-2.227 (0.423) [0.000]
The length of the label's historical path × ID	-0.829 (0.231) [0.000]	-0.678 (0.203) [0.001]	-0.711 (0.208) [0.001]
The length of the label's historical path × MFD	-0.622 (0.209) [0.003]	-0.637 (0.207) [0.002]	-0.631 (0.205) [0.002]
The length of the label's historical path × DDLTL	-4.009 (0.692) [0.000]	-4.363 (0.658) [0.000]	-3.925 (0.675) [0.000]
The length of the label's historical path × DDHM	-1.498 (0.688) [0.029]	-2.117 (0.632) [0.001]	-1.785 (0.682) [0.009]
Residual			0.053 (0.416) [0.900]
Constant		-1.681 (4.730) [0.722]	
Number of observations	16,986	17,314	17,314
Number of music organizations	5,034	5,129	5,129
Number of first digital releases	1,472	1,532	1,532
Log pseudolikelihood	-9,374	-1,288	-9,804

<sup>a</sup> Robust standard errors (record label clustered) in parentheses, p-values in brackets; Country, label type, and year dummies included. Model 8 is based on a research sample excluding major labels (Universal, Sony, and Warner). Model 9 presents the result of the parametric regression survival-time model with a Weibull survival distribution. Model 10 reports the second-stage results of 2SLS using the average age of labels in a label type as an instrument.

sharing of best digitalization practices among industry peers while effectively curbing digital piracy. Additionally, policymakers can promote investments in digital infrastructure to bridge the gap between traditional and digital technologies, thereby reducing the mismatch between organizational and environmental resources and making the adoption of digital technology more attainable.

### 6.3. Limitations and future research

Despite its theoretical and empirical novelty, this study has several limitations that warrant attention in future research. Although our focus on the length of historical paths has enabled this study to investigate a temporal dimension of organizational path dependence (Sydow et al., 2009), such a focus resulted in a lack of examination of other dimensions of path dependence. According to Sydow et al. (2009), path dependence indicates the pattern of historical outcomes of an organization's previous decisions and past processes. The length of the process can be one dimension of a pattern (i.e., the temporal dimension, Argyres et al., 2020), but other dimensions, such as the level of vibration and the magnitude of major events in the process, deserve deliberative studies. Moreover, while our focus on the delay of the first digital release sheds new light on the impact of path dependence, we found that some music labels eventually embraced digital technologies in their traditional practices. It would be valuable for future studies to examine path-breaking and strategic renewal and explore the establishment of new paths. Furthermore, our study focuses on online digital music releases. However, we could not distinguish between music downloading and access-based music-sharing services due to the data limitation. Nevertheless, technological development has shifted consumer preferences to music streaming and access-based services through digital platforms such as Spotify, Apple Music, and Amazon Music (Åkesson et al., 2018; Vendrell-Herrero et al., 2018). This is an important issue, as music streaming technology has enabled consumers to attach value to the mobility and ubiquity of digitized music. In contrast, the need to own a device (e.g., an MP3 player) to play downloaded music has become less critical. Urbinati et al. (2019) found that record labels responded faster in the face of more recent digital disruptive innovations. Similarly, although consumers' preferences for music releases are likely to influence record labels' activities, we were not able to test the impact of music consumption trends on record labels' adoption of digitalization, due to the lack of trend information over the time window of this study (19 years). Thus, future research could potentially make contributions by examining this effect. Moreover, our theoretical focus on the four moderating effects enables this study to contribute novel insights to the literature, but there could be other moderating effects (e.g., organizational culture, music trends) and mediating effects (e.g., the impact of lengthy historical path on diversified markets that, in turn, affect digitalization). Future research on these indirect mediations will potentially make significant contributions to the literature.

### CRedit authorship contribution statement

**Ryan W. Tang:** Writing – review & editing, Writing – original draft, Visualization, Software, Resources, Project administration, Methodology, Investigation, Formal analysis, Conceptualization. **Yi Wang:** Writing – review & editing, Writing – original draft, Validation, Investigation, Conceptualization.

### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.



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## Appendix A. Digitalization in the music distribution industry

With the advent of digital technologies, new opportunities for value creation and capture have emerged, and firms have begun to digitize their physical products (Bohnsack et al., 2021). The digitalization of physical products is arguably the most prominent feature in the culture industry (Mangematin et al., 2014) and particularly in the music industries (Bello & Garcia, 2021; Bourreau et al., 2013; Brewster, 2021). Traditionally, record labels were responsible for the entire music recording process from beginning to end. They searched for artists, developed, promoted, manufactured, and distributed their music in exchange for a large proportion of the revenue. Record labels were the driving force behind the most popular and successful musicians before the digital era. Throughout the years, many labels were established, but they eventually consolidated to become the “Big Three” music major labels—Warner Music Group, Sony Music Entertainment, and Universal Music Group—which own a variety of sub-labels.

A music label’s adaptation to digitalization is multidimensional and encompasses the digitization of talent scouts (A&R—Artist and Repertoire), distribution, and marketing and promotion (Bourreau et al., 2013). Arguably, the way in which music is distributed and promoted has been among the functions within a record label that have been affected most. The music distribution industry has experienced three waves of digitalization in recent decades thanks to the rise of the Internet. The first wave was the boom of unauthorized music file-sharing forums around 2000 (e.g., Napster, established in 1999) facilitated by peer-to-peer (P2P) technology, fast internet access, and the increasing spread of MP3 data compression technology. The next and second wave of change was in 2004, with legitimate music downloads through, for example, Apple’s iTunes Music Store. The third and most recent wave was the digital transformation that has shifted consumer focus from music downloading to music streaming services through digital platforms such as Spotify, Apple Music, and Amazon Music (Åkesson et al., 2018). In a digital era, music aggregators and distributors alike have become the new gatekeepers of the music industry. Record labels that own the copyright to sound recordings pay a fee or commission to aggregators or distributors to ensure their content is available on digital platforms at a designated date and time. Existing research on the digitalization of music distribution has addressed music labels’ reactions to illicit P2P file-sharing (Coelho & Mendes, 2019; Coyle et al., 2009; Rogers, 2013), the impacts and operations of music streaming and downloading services (Morris, 2015), and the transformation of record labels’ business models and value chains (Graham et al., 2004; Moyon & Lecocq, 2014).

## Appendix B. Music formats

Changing and diversifying music formats have been one of the major features of the music industry over the last century. In the pre-digital age, music fans had several options when listening to music. Traditionally, music consumers could purchase pre-recorded music from record shops and mass merchants in various physical formats, such as vinyl, cassette, CD, and Digital Video Disc (DVD), which were commercially very successful (Shakhovskoy & Toulson, 2015). Other physical formats, such as digital audio tape (DAT), digital compact

cassette (DCC), and Sony’s MiniDisc, were less prevalent in the market (Co-operation & Development, 2005; Shakhovskoy & Toulson, 2015). However, since the turn of the millennium, the significance of releasing music in physical formats has been tremendously threatened by online digital formats such as music sharing (e.g., Napster), downloading (e.g., Apple’s iTunes Store), and streaming services (e.g., Spotify and Pandora). Although the benefits of physical formats are primarily related to physicality in that they provide a more focused and potentially immersive listening experience, digital formats are highly functional, providing listeners with convenience, accessibility, and portability. Additionally, unlike physical formats, music released in a digital format allows consumers to create tailored playlists (Brown & Krause, 2020).

## Data availability

Data will be made available on request.

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